International Journal of Scientific Research in Engineering and Management (IJSREM)
Volume: 05 Issue: 06 | June - 2021 ISSN: 2582-3930

Printed T-Shirt Designer

Prof. Mahendra Shinde[1], Anshusingh Rajput[2],Yash Jagdale[3]

[1,2,3]*Department of Computer Engineering, MIT Polytechnic, Pune, India*

Abstract -In today's world T-Shirts are most preferred and acceptable in Indian Market, Earlier T-Shirts were preferred by children and teens only, but now a days people of all age groups wear T-shirts, because of which different kind of opinions for t-shirt designs has been build up among different age groups, and due to this customers are not able to find out t-shirts of their choice. The purpose of this project is to provide a web application named Printed T-Shirt Designer that would allow customers to design a T-shirt according to their choice and place an order of designed T-shirt. Customers can select T-shirt color, add text, choose Font, choose Font color, select an image, apply filters to images, transform text or images, choose T-shirt size and save designs for future references. Customers would be able to add the design to a cart, manage cart and checkout with their credit card to purchase for the order and view their previous orders. The project focuses on object-oriented programming paradigm using node.js (express framework) along with JavaScript, CSS, and HTML, Bootstrap and mongo DB. Printed T-Shirt Designer application uses Stripe API to handle the credit card payments tokens providing a secure way for customers to purchase a T-shirt and Canvas to handle real-time Graphics. Google SMTP is used to send confirmation of purchase order to administrator and customer. The project is available for browser supporting devices including mobile devices since the application will be responsive web design so that design and development should respond to the user's behavior and environment based on screen size, platform, and orientation.

***Key Words*:**SMTP (Simple Mail Transfer Protocol), Stripe API, Real-time Graphics, HTML, Bootstrap, JavaScript etc.

1.INTRODUCTION

In the past, customers could only decide to buy a T-shirt but they had some own ideas for the T-shirt which they were not able to find that. Or some were having color problems. This may substantially reduce the willingness of customers to purchase apparel online. Therefore, online sales of Apparel, a product type for which customer desire to customize the T-shirt as per their mind or new ideas. However, as some improvements such as free returns, free deliveries, online sales of apparel have gradually become a success. In recent years, the Internet has emerged as a compelling channel for sale of apparel.

The purpose of this project is to provide a web application named Printed T-Shirt Designer. This application will be online and can be used by anyone, just he needs to register, fill a form, Choose Design, Color and select quantity. This application provides two main services for customers. Firstly, it provides a way for customers to design and save the design for future purchases. Secondly, it provides an easy way to purchase T-shirt Design using a shopping cart system. The application will have Admin Login which will check for member details and orders, Member Login in which they can create, customize design using wide range of Colors & Patterns, and can even place bulk order for the same. This ordered T-Shirt will be delivered to their door steps. The application is free to sign up. They can customize the style they want for their products. As there is the options for home deliver and return as well with free of cost.

Due to such pandemic situations and lack of time, people are not able to go out, so our project is going to help people to choose and customize T-Shirts attractive and creative. It is available for browser supporting devices including mobile devices since the application will be responsive web design so that design and development should respond to the user's behavior and environment based on screen size, platform, and orientation.

2. LITERATURE SURVEY

1) TDTOS – T-shirt Design and Try-On System

In this paper, a new framework for T-shirt design and try-on simulation based on FPGA is presented. Users can not only gain realistic try-on experience, but also design the T-shirts all on their own. The design approach of this system consists of three major parts. First, collect relevant information from the camera and identify the position of the clothes. Second, process the retrieved data and modulate the color of the clothes with folds and shadows remained. Third, place built-in or user-designed pictures onto the clothes and simulate their deformation while the user moves arbitrarily. In comparison with existing virtual clothes fitting systems, our system provides the flexibility of designing customized pictures on the T-shirt with realistic virtual try-on simulation in real-time.

2) An Analysis on T-shirts Design

The purpose of this study was to analyze characteristics of effective expression on T-shirts pattern by pierce's semiotic theory. The results of this study were as follows: First of all, iconic expression showed high frequency after 2000. Characteristics of effective expression were as follows: In geometric expression, repetition was presented as a symbolic sign by regular proportion and rule of dot, line, and plane, and irregularity, mixture of irregular dot, line, and plane. Mixed expression was presented as an iconic and symbolic sign by collage, mixture of dot, line, plane, icon and letter. In iconic expression, simplification of iconic sign was presented as a iconic sign by simplification of form, colour, texture, realistic expression using digital as a iconic sign, and symbolic face, body as a symbolic sign. Pop art's expression was presented as an iconic sign by a cartoon and commercial character and illusion was presented as an iconic sign. In letter's expression, brand logo was presented as a symbolic sign by transformation of letter's design, a symbolic sign of numeral by transformation of size, thickness, form, and colour. Symbolic message phrase was presented by slogan, fashion trend, brand image, descriptive indication message as a index sign by using icon or singleness. In conclusion, characteristics of effective

expression on T-shirts pattern will present not only the theoretical foundation to raise the value added, but also the information about beauty sense of times, political and social value.

3) Arts and Design Studies Portable T-Shirt Printing Machine

T-shirt printing is one of the occupations of the youth. Various methods of printing such as dye sublimation, heat transfer and screen printing are employed to print t-shirts. However, screen printing is the most popular method in Ghana. It is easy to use and less expensive. Despite the fact that the screen printing method is the most preferred in Ghana, its processes come with challenges. The printing process is slow and the products that are churned out are of low quality. And in order to minimize the problems that local printers encounter during screen printing, the "Portable T-shirt Printing Machine" has been developed. The machine which is manually operated comes with an adjustable squeegee, leather padded table, an adjustable metallic frame which holds the screen during printing and a magnetic holder which holds the frame taut during printing without the help of a second person. The squeegee can be moved manually by the help of a bearing and a hollow pipe. The squeegee blade which is made of rubber can easily be removed and washed after each printing session. The Portable T-shirt Printing Machine which is 75cm long, 45cm wide and 12cm high can be carried easily and printing can be done anywhere whether there is electricity or not. The adjustable metallic frame which holds the frame can be adjusted to suit any screen size; ranging from (40 cm by 40cm) to (15cm by 15m) or even smaller screens. The research design adopted for the study is the qualitative (descriptive) approach. The sample population for the study is 108 representing 30% of the target population. The data collecting instruments used were interview, observation and questionnaire. The main findings of the study were that, the speed of the traditional screen printing process can be increased when a machine is developed. Also, the fastness and efficiency of the t-shirt printing process have a direct relation with the income earned. It is therefore recommended that the "Portable T-shirt Printing Machine" is adopted by the local printers to enhance their occupation. It is also recommended that the metal parts of the machine are oiled regularly to prevent friction and rusting. Furthermore, a challenge is thrown to prospective researchers to conduct a research into the automation of the "Portable T-shirt Printing Machine" so as to increase its speed.

4) A Review Paper on E-Commerce

E-commerce is a boom in the modern business. E-commerce means electronic commerce. E-commerce (Electronic commerce) involves buying and selling of goods and services, or the transmitting of funds or data, over an electronic network, predominantly the Internet. E-commerce (Electronic commerce) is a paradigm shift influencing both marketers and the customers. Rather e-commerce is more than just another way to boost the existing business practices. It is leading a complete change in traditional way of doing business. This significant change in business model is witnessing a tremendous growth around the globe and India is not an exception. A massive internet penetration has added to growth of E-commerce and more particularly start-ups have been increasingly using this option as a differentiating business model. Moreover E-Commerce has significant influences on the environment. Although the model is highly used in current business scenario but the option has not been explored at its fullest. The current research has been undertaken to describe the scenario of E-Commerce, analyze the trends of E-Commerce. The study further examines the key variables imperative for the success of E-commerce business models.

3. SYSTEM ARCHITECTURE

This project provides two main services for customers. Firstly, it provides a way for customers to design and save the design for future purchases. Secondly, it provides an easy way to purchase that T-shirt Design using a shopping cart system. Customers can customize T-shirt and place an order of custom T-shirt. Customers can sign up, sign in, select T-shirt colour, add text, choose Font, choose Font colour, apply clip arts, choose T-shirt size and save designs for future references. Customers would be able to add the design to a cart, manage cart and checkout with their credit card to purchase for the order and view their previous orders.

1) USER: User can perform Entry/ Exit operation as well as can create, customize, and design different T-Shirts using wide range of Colour & Patterns.

2) ADMIN: Admin will check for member details and orders.

3) CREATE/ CUSTOMIZE T-SHIRTS: It create, customize, and design different T-Shirts using wide range of Colours, Clip Arts & Patterns.

4) PAYMENT GATEWAY: To perform online transactions.

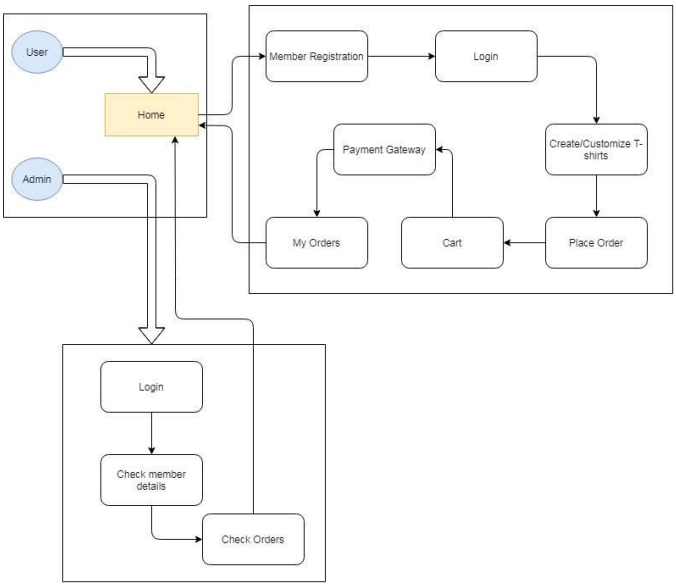

Fig 3.1 System Block Diagram

4. PROPOSED METHODOLOGY

Nowadays, printed T-shirts are almost seen everywhere: school uniforms with the school logos printed on it, advertisements printed on T-shirts, title of an event, different cartoon characters, quotable phrases and lot more things printed on T-shirts. There are many processes of transferring a design to a shirt. Computer printed designs are among the most common. One can have his own picture printed in a T-

shirt in just an hour or he can even personalize a design that he likes to be printed in his T-shirt.

4.1 PRODUCT PAGE MODULE

The product page contains two categories namely Featured products and customize products. Featured products have the t-shirts which is already displayed for ideas for customization and we can also purchase that one. Customize products contains the t-shirt designed or customize by the user. This also contains the social media icons such as instagram, facebook, twitter in order to contact us.

4.2 CUSTOMIZATION MODULE

This is the main module of our system. In this module, the user gets the vast verities to customize or design his/her t-shirts. He/she can choose between t-shirt with half selves, full selves and sleeveless and also can select the hoodie which is more in fashion trend now-a-days. The user gets the vast range of different color shades that can be upload to the product. He/she also can add the stickers/clip art to their products. There are many verities in clipart also which can be adjustable according to the user choice. Here the user also gets the option named 'text'. He/she can add any text of their choice. They can modify their text by changing the color of the text, by changing the size of the text and also the font of the text. They can bring that text forward or backward with just one tap on button. They can preview their product from all sides, as they can get a brief idea of what kind of product are they purchasing. The user can adjust the text and clip art according to his/her need on the product. This module also contains the size of product. The price will change with respect to the size of product. This option called 'add design to homepage' which will add your product to the home page in the customize product part. The user can also add the product directly to the cart.

4.3 SHOPPING CART MODULE

The shopping cart module holds two options. Firstly, proceed to buy which takes the user to the checkout page. The user can delete the items add to the cart by using the option delete item. This is the simple module just to make the user selection easier and faster. The user can add the products to the shopping cart from either the home page or from the customization module.

4.4 CHECKOUT MODULE

This module has various fields for users that should be compulsory filled to proceed further. The user first has to enter his/her full name. Then he/she must entered the correct email following with the phone number. The address of the user should be more specific as the order has to be delivered on that address. Then the details regarding country, state and pin code is given. Then the user should select the payment method. It should be either credit card or debit card. The details regarding cards must entered such as name of the card, the number of the card, the expiry date of the card, similar expiry year of that card and the last CVV respectively. The user can see the detailed of his product on the top right of the page along with the total priced to be paid. The user can proceed to 'continue to checkout' which will display the successful text of ordered product. Basically, this module is for the detailed information of user for security purpose.

4.5 ADMIN DASHBOARD MODULE

In this module there certain sub-module namely Users, Products, Orders, Clip Art and Messages. In the users module the admin can manage the users that sign ups to the website. Then the products module contains 3 categories which are featured products, customize products and private products. The orders module contains the detailed information regarding the orders placed by the user. The clip arts are the function where we can add some more clips arts for customization or similar delete some of them. The last module messages contains the feedback text that are given by various users.

5. SOFTWARE SPECIFICATION

HTML(Hypertext mark-up language)

- HTML is the standard markup language for creating Web pages.
- HTML stands for Hyper Text Markup Language.
- HTML describes the structure of Web pages using markup.
- HTML elements are the building blocks of HTML pages.
- HTML elements are represented by tags.
- HTML tags label pieces of content such as "heading", "paragraph", "table", and soon.
- Browsers do not display the HTML tags, but use them to render the content of the page.
- All HTML documents must start with a document type declaration: <!DOCTYPEhtml>

CSS(Cascadingstylingsheet)

- CSSstandsforCascadingStyleSheets
- CSS describes how HTML elements are to bedisplayedonscreen,paper,orinothermedia.
- CSSsavesalotof work.It cancontrolthelayoutofmultiplewebpagesallatonce
- External Style Sheet are stored in CSS files. CSS isusedtodefinestylesforyourwebpages,includingthe design,layoutandvariationsindisplayfordifferentdev icesandscreensizes.
- Thestyledefinitionsarenormallysavedinexternal.css files.
- Withanexternalstylesheetfile,youcanchangethelook ofanentirewebsitebychangingjustonefile!

JavaScript

- JavaScript often abbreviated as JS, is a high-level, interpreted programming language that conforms to the ECMA Script specification. It is a programming language that is characterized as dynamic, weakly typed, prototype-based and multi-paradigm.
- Alongside HTML and CSS, JavaScript is one of the core technologies of the World Wide Web. JavaScript enables interactive web pages and is an essential part of web applications. The vast majority of websites use it, and major web browsers have a dedicated JavaScript engine.

Bootstrap

- Bootstrap is free and open source front-end web

framework. It contains HTML and CSS-based design templates for typography, forms, buttons, navigation and other interface components, as well as optional JavaScript extensions. Unlike many earlier web frameworks, it concerns itself with front-end- development only.

- Bootstrap is a web framework that focuses on simplifying the development of informative webpages (as opposed to web apps)

Node.js

- Node.js allows the creation of Web servers and networking tools using JavaScript and a collection of "modules" that handle various core functionalities. Modules are provided for file system I/O, networking (DNS, HTTP, TCP, TLS/SSL, or UDP), binary data (buffers), cryptography functions, data streams, and other core functions. Node.js modules use an API designed to reduce the complexity of writing server applications.
- JavaScript is the only language that Node.js supports natively, but many compile-to-JS languages are available. As a result, Node.js applications can be written in CoffeeScript, Dart, TypeScript, ClojureScript and others.

Database: MongoDB

- MongoDB is a source-available cross-platform document-oriented database program. Classified as a NoSQL database program, MongoDB uses JSON-like documents with optional schemas.

6. RESULTS AND OUTPUT

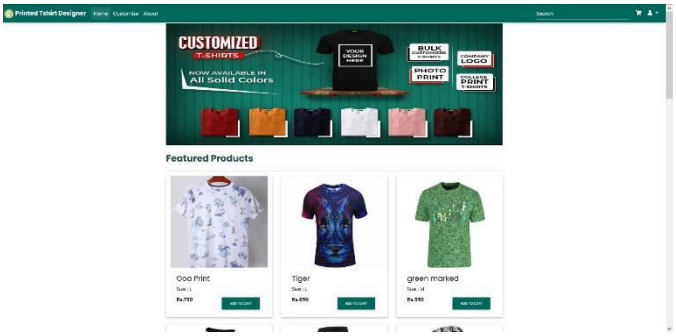

Fig 6.1 Product Page

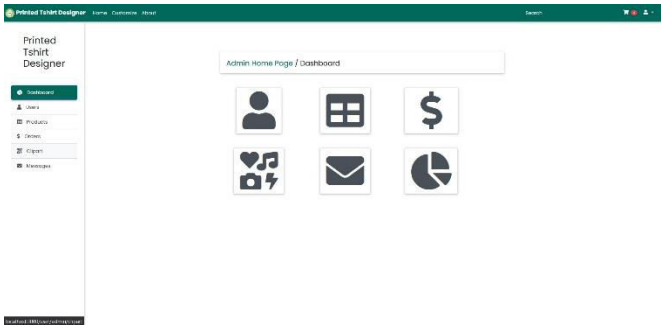

Fig 6.2 Admin Dashboard

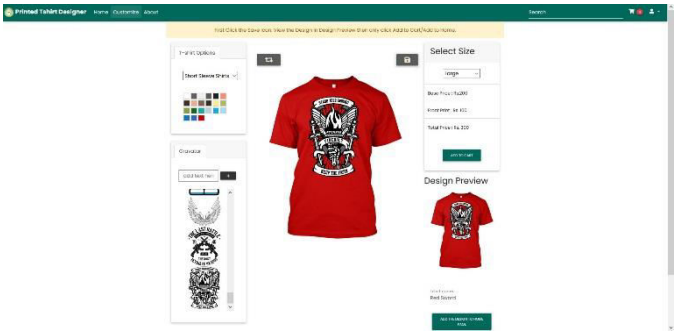

Fig 6.3Customization

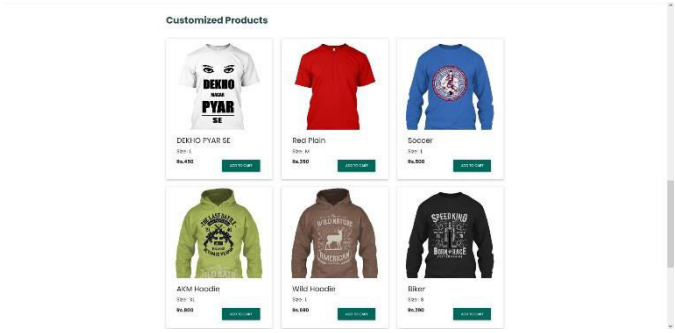

Fig 6.4 Customized T-Shirt

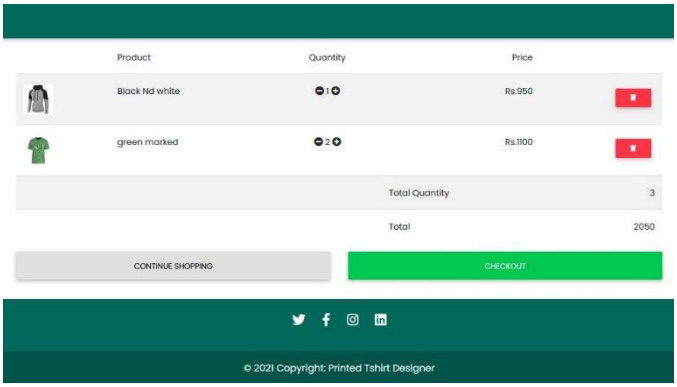

Fig 6.5 Cart

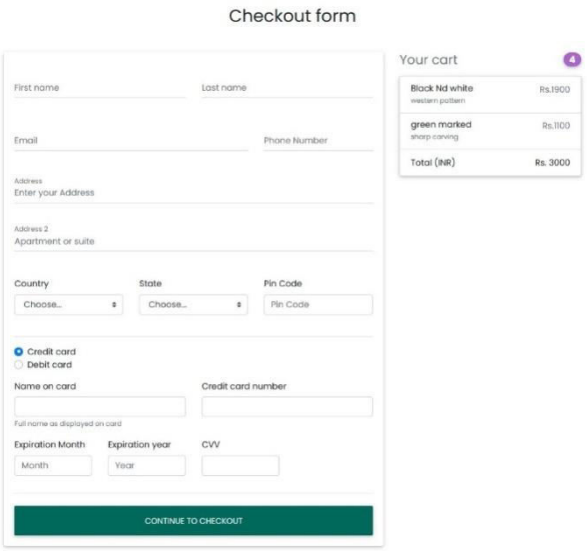

Fig 6.6 Checkout Form

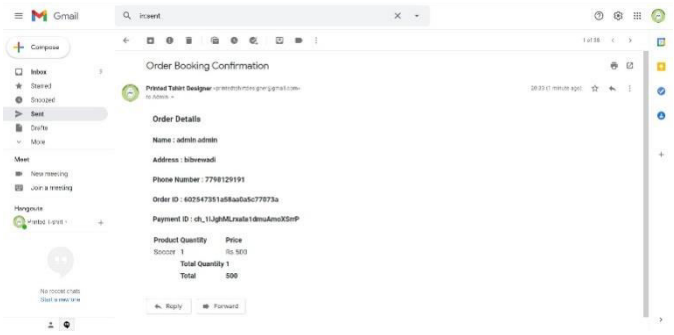

Fig 6.7 Successful Email

7. CONCLUSIONS

This project aims to create a fast, robust and secure web application. Printed T-Shirt Designer stands out to be a successful application that lets a customer to pick their choice of design or make their own design with the functionality of adding text, image and apply filters and save the entire design for future reference.

ACKNOWLEDGEMENT

We are profoundly grateful to Prof. MahendraShinde of the Computer Engineering Department for her expert guidance and continuous encouragement throughout to see that this project rights its target from its commencement to its completion. I would like to express my humble appreciation towards Dr. Prof. R. S. Kale Principal, Prof. J. P. Khurpade HOD of Computer Department MAEER'S MIT POLYTECHNIC, Pune, Whose invaluable guidance supported me in completing this project.
At last, I must express my sincere heartfelt gratitude to all the staff members of the Computer Engineering Department who helped me directly or indirectly during this course of work.

REFERENCES

1) Chen-Yu Hsu*, Chi-Hsien Yen*, Wei-Chiu Ma*, and Shao-Yi Chien, “TDTOS – T-shirt Design and Try-On System”, National Taiwan University, Taiwan 2012.
2) Gbadegbe Richard Selase, Vigbedor Divine, Dzade Elorm, Amewu Joseph, Agra Florence Emefa, Amankwa Joana, “Arts and Design Studies Portable T-Shirt Printing Machine”, Ho Technical University, Ghana, September 2017.
3) Dr. Shahid Amin Bhat, Keshav Kansana, “A Review Paper on E-Commerce”, ITM University, February 2016.
4) Choi Jung-Hwa, “An Analysis on T-shirts Design”, Journal of the Korean Society of Clothing and Textiles, January 2005.
5) Ahmet Özbek, “Online customized T-shirt design and evaluation of online websites for Customization”, Marmara University. September 2020.